

**U.S. Department of the Interior, Patricia Sanderson Port,  
Regional Environmental Officer  
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**United States Department of the Interior**

OFFICE OF THE SECRETARY  
Office of Environmental Policy and Compliance  
1111 Jackson Street, Suite 520  
Oakland, California 94607-4807

June 2, 2004

ER 04/330

Mr. Thomas Grim, Document Manager  
National Nuclear Security Administration, Livermore Site Office, L-293  
7000 East Avenue  
Livermore, CA 94550-9234

Subject: Draft Site-Wide Environmental Impact Statement (DEIS) for Continued  
Operation of Lawrence Livermore National Laboratory and Supplemental  
Stockpile Stewardship and Management Programmatic EIS, Livermore, Alameda  
County, California

Dear Mr. Grim,

The U.S. Department of the Interior has received and reviewed the subject document and has no  
comments to offer.

Thank you for our opportunity to review this project.

Sincerely,

*Patricia Sanderson Port*  
Patricia Sanderson Port  
Regional Environmental Officer

cc: Director, OEPC, D.C.  
FWS, Portland

NO COMMENTS IDENTIFIED IN THIS SUBMITTAL

**U.S. Department of Peace Coalition, Prof. Marjorie Zamora and  
Peacemakers Action Coalition, Alan Sinclair  
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**Stop the Weaponization of Space Press Release**

For distribution 27 April 2004

*"The destruction of the enemy is the destruction of yourself"  
"We and they are no longer there, they are also part of we, and we are also part  
of they." H.H. Dalai Lama. Toronto April 2004.*

1/02.01

The US already has thousands of nuclear weapons, enough to wipe us all out. When the USSR was seen as a threat, this was used as a deterrent – a deterrent called "MAD", for "Mutually Assured Destruction." Threats are different now, but the idea of making more nuclear weapons is still just MAD. More than that, it's a unrealistic plan. You cannot make the world safer by developing nuclear weapons. They only add to the risks.

2/23.01

The risks of nuclear weapon development are both obvious and hidden. The obvious risks you all know; the hidden ones are of an ever-more toxic environment, and permanent damage to our children. There is no excuse for this. Radiation toxicity levels in Livermore homes have been rising for decades, and now the Department of Energy wants to increase the nuclear activity.

3/32.03

And not only that, there are plans to base weapons in space, hurtling round the earth, our mother, all the time. Space is free of weapons now, but later this year the Administration will begin launching armed satellites. We must stop this – there's still time to stop it. The Preservation of Space Act HR 3657 prohibits putting weapons in space. Push your representatives to pass the bill.

The Preservation of Space Act provides for international treaties to ban space weapons. We are working to get twenty countries to sign the treaties. It's not too late, but we have to act **NOW**.

For more information:  
Prof Marjorie Zamora  
US Department of Peace Coalition  
www.dopc.us  
1-708-246-7363

Alan Sinclair  
Peacemakers Action Coalition  
831-425-2807

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION IX  
75 Hawthorne Street  
San Francisco, CA 94105

May 27, 2004

Thomas Grim  
National Nuclear Security Administration  
U.S. Department of Energy - Livermore Site Office (L-293)  
700 East Avenue  
Livermore, CA 94550

Subject: Draft Environmental Impact Statement (DEIS), Site-wide Continued Operation of Lawrence Livermore National Laboratory (LLNL) and LLNL Site 300, Alameda and San Joaquin Counties, California (CEQ #040086), and Programmatic Draft Supplemental EIS (PDSEIS), Stockpile Stewardship and Management Plan, Use of Proposed Materials, LLNL National Ignition Facility, Alameda County, California (CEQ #040087)

Dear Mr. Grim:

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced document pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's (CEQ) NEPA Implementing Regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act. Our detailed comments are enclosed.

EPA has had previous involvement with the two EISs and these sites. EPA sent scoping comments on a Notice of Intent to prepare a site-wide DEIS on August 2, 2002, following our July 8, 2002 letter providing information on cooperating agencies. EPA sent comments on a Stockpile Stewardship Programmatic DEIS on May 7, 1996, rating it Environmental Concerns - Insufficient Information (EC-2) due to accident risk analyses and environmental justice impacts. EPA's December 13, 1996 letter on the Stockpile Stewardship Programmatic Final EIS stated that our May 7, 1996 concerns were addressed. EPA sent comments on a Stockpile Stewardship Supplemental EIS on July 31, 2003, rating it Lack of Objections but seeking clarification on radionuclides in wells. EPA also conducted a multi-media inspection of LLNL from November 4 to 7, 2003. A Compliance Evaluation Inspection Report was provided to LLNL on May 21, 2004.

EPA's review of the subject DEIS/PDSEIS identifies environmental concerns with: (1) LLNL's Spill Prevention, Control, and Countermeasure capabilities; (2) mitigation to reduce radionuclide emissions and construction-related air quality impacts; (3) environmental contaminants; and (4) accident-related issues. EPA rates the DEIS/PDSEIS and each EIS's Proposed Action as EC-2. Please see the enclosed "Summary of EPA Rating Definitions" for further information on our rating system.

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1/31.03,  
26.02

EPA notes that, for each project, the DEIS/PDSEIS fully evaluates three alternatives-- No Action, the Proposed Action, and a Reduced Operation Alternative. The two EISs are integrated in one document, an approach used infrequently by Federal agencies. With the limited exception of Appendix M, the analysis for both projects is integrated throughout the document. Although the DEIS/PDSEIS comprehensively evaluates impacts to resources at LLNL and Site 300, it does not distinguish each project's specific contribution to overall environmental impacts (see Chapter 5, Volume I). Because both projects' alternatives and affected resources are identical, it is unclear whether the final preferred alternatives for each project are interdependent, and whether selecting the Proposed Action for one project precludes selecting No Action or a Reduced Operation Alternative for the other project. Accordingly, the Final EIS/Programmatic Final SEIS (FEIS/PFSEIS) should clarify the relationship between each project's final preferred alternative; disclose impacts of reasonable scenarios that have not been addressed; and identify how decision-making for the respective projects is expected to proceed (e.g., a joint NEPA Record of Decision or two separate NEPA Records of Decision).

We appreciate the opportunity to comment. Please send one copy of the FEIS/PFSEIS to the letterhead address (mailcode: CMD-2) when available. If you have questions, please contact my staff reviewer, David Tomsovic, at 415-972-3858 or <tomsovic.david@epa.gov>.

Sincerely,

*Lisa B. Hanf*  
Lisa B. Hanf, Manager  
Federal Activities Office

Enclosures: 4  
"Summary of EPA Rating Definitions"  
EPA's Detailed Comments  
May 21, 2004 EPA Letter to LLNL  
April 12, 2004 Defense Nuclear Facilities Safety Board Letter to NNSA

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### SUMMARY OF EPA RATING DEFINITIONS

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

#### ENVIRONMENTAL IMPACT OF THE ACTION

##### "LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

##### "EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

##### "EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

##### "EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

#### ADEQUACY OF THE IMPACT STATEMENT

##### Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

##### "Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

##### "Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

\*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

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U.S. EPA Comments - Draft Environmental Impact Statement (DEIS) for Site-wide Continued Operation, Lawrence Livermore National Laboratory (LLNL) and LLNL Site 300, and Programmatic Draft Supplemental EIS (PDSEIS) for Stockpile Stewardship and Management Plan for Use of Proposed Materials, National Ignition Facility, LLNL - May 27, 2004

#### Regulatory Inspections

Volume I (pp. 7-10 to 7-12) addresses regulatory inspections conducted by State and local authorities at LLNL through October 2002. EPA conducted a multi-media inspection at LLNL from November 4 to 7, 2003 to determine the facility's compliance with Federal environmental requirements including:

- Oil Pollution Act (OPA) Spill Prevention, Control and Countermeasure (SPCC) Plan;
- Clean Air Act (CAA) National Emission Standards for Hazardous Air Pollutants (NESHAP) - radionuclides;
- Resource Conservation and Recovery Act (RCRA) hazardous waste regulations and RCRA Section 6002;
- RCRA Underground Storage Tank (UST); and,
- Emergency Planning and Community Right-to-Know Act (EPCRA) except Toxic Release Inventory (TRI) provisions.

2/31.07

EPA also undertook a multi-media "screening" to identify potential deficiencies with other Federal environmental requirements, specifically:

- Clean Water Act (CWA) storm water;
- EPCRA TRI;
- Safe Drinking Water Act (SDWA) Underground Injection Control (UIC);
- CAA ozone-depleting Class I and Class II substances; and,
- CAA chromium NESHAP.

EPA issued a Compliance Evaluation Inspection Report which identifies opportunities to strengthen LLNL's compliance with Federal environmental requirements (EPA's May 21, 2004 letter to LLNL is enclosed). EPA's inspection found that LLNL's 1995 SPCC Plan is not current as required by 40 CFR Part 112. Federal regulations require that SPCC plans be periodically evaluated for accuracy and completeness. If significant facility changes occur, an SPCC plan needs to be amended.

EPA determined that the description of aboveground oil storage locations in the 1995 SPCC Plan does not correspond to the facility's current tank inventory. LLNL is thus required to prepare an amended SPCC Plan by August 17, 2004 reflecting changes in facility operations. An update of LLNL's SPCC Plan and other issues in EPA's Compliance Evaluation Inspection Report are relevant to actions proposed in the DEIS/PDSEIS.

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2/31.07  
cont.

Recommendations: The Final EIS/Programmatic Final Supplemental EIS (FEIS/PFSEIS) should discuss EPA's multi-media inspection at LLNL, and address how EPA's findings and recommendations would be incorporated in the fully evaluated alternatives. In particular, the FEIS/PFSEIS should evaluate how LLNL would address compliance with SPCC regulations. If available, the findings and recommendations of any other environmental compliance inspections at LLNL and Site 300 since October 2002 should be reflected in the FEIS/PFSEIS.

Air Quality

Reducing Radiological Emissions and Pollution Prevention

The DEIS/PDSEIS states, "LLNL adheres to stringent requirements to ensure that air emissions are mitigated to the extent practicable throughout the design, review, and implementation phases of modification activities." (Vol. I, p. 5.3-26 - *italics added*). The DEIS/PDSEIS does not address if this objective applies to radiological emissions at LLNL and Site 300. Although EPA's November 2003 inspection found that LLNL's radiological emissions comply with the radionuclide NESHAP regulations, the DEIS/PDSEIS does not address whether radiological emissions at LLNL and Site 300 are mitigated to the extent practicable from "cradle to grave" (e.g., inventory management; research and development; stack emissions; and production, processing and testing activities). To give one example, the DEIS/PDSEIS does not evaluate whether an extended lifespan for open air firing tables, which are projected to "far exceed" shots at a Contained Firing Facility "for the foreseeable future," could be minimized to reduce radiological emissions (see Table 5.3.10.1-1).

The Council on Environmental Quality (CEQ) states, "All relevant, reasonable mitigation measures that could improve the project are to be identified...Once the proposal itself is considered as a whole to have significant effects...mitigation measures must be developed where it is feasible to do so." (CEQ, March 23, 1981, Forty Most Asked Questions on CEQ's NEPA Regulations). CEQ has issued guidance on including pollution prevention measures in NEPA documents (CEQ, January 12, 1993, Pollution Prevention and NEPA).

Recommendations: The FEIS/PFSEIS should evaluate the feasibility of mitigation to reduce radiological emissions to the extent practicable at LLNL and Site 300. Should this mitigation be feasible, include appropriate commitments in the NEPA Record(s) of Decision.

Quantifying and Mitigating Construction Emissions

Volume I (p. 4-10-8) states that the San Francisco Bay Area and the San Joaquin Valley are "nonattainment" for the Federal ozone standard. The San Joaquin Valley is also classified as nonattainment for the Federal standard for particulate matter less than 10 microns in diameter (PM-10).

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4/17.03  
cont.

Volume I addresses emissions from constructing or modifying facilities (pp. 5.1-6 and 5.1-7). This section states that the Bay Area Air Quality Management District (BAAQMD) places a greater importance on controls rather than detailed quantification of construction emissions. The DEIS/PDSEIS states, "From the district's perspective, quantification of construction emissions is not necessary; the determination of significance with respect to construction emissions should be based on consideration of the control measures to be implemented." (p. 5.1-7). Construction emissions are thus not quantified.

The BAAQMD has a three-tier set of measures to reduce PM-10 emissions from construction (Vol. I, p. 5.1-7). The DEIS/PDSEIS does not identify what measures would be implemented at LLNL and Site 300 to reduce PM-10 emissions. It does not evaluate the feasibility of other relevant mitigation to reduce other construction emissions, including hydrocarbons (HC), volatile organic compounds (VOC), carbon monoxide (CO), oxides of nitrogen (NOx), and diesel particulate matter (DPM). Mitigation measures to reduce emissions of VOC and NOx are particularly appropriate since they are ozone precursors, while DPM is an air toxic. The following mitigation measures may reduce construction-related emissions:

- Reducing emissions of DPM and other air pollutants by using particle traps or other methods. Control technologies such as traps control approximately 80 percent of DPM. Specialized catalytic converters (oxidation catalysts) control approximately 20 percent of DPM, 40 percent of CO emissions, and 50 percent of HC emissions.
- Ensuring that diesel-powered construction equipment is properly tuned and maintained, and shut off when not in direct use.
- Prohibiting engine tampering to increase horsepower.
- Locating diesel engines, motors, and equipment as far as possible from residential areas and sensitive receptors.
- Requiring low sulfur diesel fuel (<15 parts per million) if available.
- Reducing construction-related trips of workers and equipment, including trucks.
- Leasing or buying newer, cleaner equipment (1996 or newer model), using a minimum of 75 percent of the equipment's total horsepower.
- Using engine types such as electric, liquified gas, hydrogen fuel cells, and/or alternative diesel formulations.
- Adopting a "Construction Emissions Mitigation Plan" to monitor construction-related emissions.
- Working with the air pollution control districts to develop the best available mitigation for reducing construction-related emissions at LLNL and Site 300.

Several Federal agencies have included construction-related air quality mitigation measures in their proposed actions under NEPA. For example, the National Aeronautics and Space Administration (NASA) adopted such measures in its NEPA Record of Decision for *NASA Ames Development Plan, California*. Incorporating such mitigation in the two projects can strengthen the Federal role in environmental leadership and pollution prevention.

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4/17.03  
cont.

Recommendations: The FEIS/PFSEIS should quantify, for each criteria pollutant, the reasonably foreseeable construction emissions for the fully evaluated alternatives. Quantifying reasonably foreseeable construction emissions informs the public and decision-makers on the project's air quality impacts and helps to identify appropriate mitigation at each site for nonattainment pollutants. The FEIS/PFSEIS should evaluate the feasibility of mitigation measures to reduce construction emissions (e.g., PM-10, DPM, CO, VOC, HC and NOx), and include appropriate commitments in the NEPA Record(s) of Decision.

**Environmental Contaminants**

**Monitoring at Energetic Materials Processing Center**

5/18.01,  
04.02

A proposed Energetic Materials Processing Center (EMPC) includes a processing facility and four magazines-- two storing 1,000 pounds of high explosives and two storing 500 pounds of explosives (p. 3-10, Vol. I). Groundwater at Site 300's existing high explosives area (Building 812) is contaminated with hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), perchlorate, nitrate, and trichloroethene. The DEIS/PDSEIS does not evaluate the feasibility of monitoring proposed activities at the EMPC to ensure that potential contamination, including groundwater contamination, is avoided to the fullest extent practicable.

Recommendation: The FEIS/PFSEIS should discuss the feasibility of monitoring proposed activities at the EMPC to ensure that potential contamination is avoided to the fullest extent practicable.

**Open Air Shots**

6/17.06

Shots on open air firing tables at Site 300 are projected to "far exceed" shots at a Contained Firing Facility "for the foreseeable future" (Table 5.3.10.1-1). The DEIS/PDSEIS does not address what pollutants are released as a by-product of these shots, nor address a proposed disposal method for shot-related debris. The DEIS/PDSEIS does not address whether the number of open air shots can be reduced in the "foreseeable future." It does not address impacts on the Department of Energy's environmental restoration commitments under the Comprehensive Environmental Response, Compensation, and Liability Act and/or the Resource Conservation and Recovery Act.

Recommendations: The FEIS/PFSEIS should, for each fully evaluated alternative, address what pollutants are released during shot testing, the proposed method of disposal for shot debris, the feasibility of reducing the number of open air shots, and reasonably foreseeable impacts on environmental restoration activities.

**Tritium Emissions from Hydroshots**

7/17.01

Volume I (p. 3-15) addresses tritium emissions from hydroshots at Site 300. The DEIS/PDSEIS does not address, for the three fully evaluated alternatives, the expected frequency and type(s) of radiological releases, and reasonably foreseeable impacts on existing groundwater and soil

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7/17.01  
cont.

mitigation measures.

Recommendation: For each fully evaluated alternative, the FEIS/PFSEIS should discuss the expected frequency and type(s) of radiological releases, and reasonably foreseeable environmental impacts.

**Inadvertent Events and Accidents**

**Potential Radiological Releases at Building 332**

8/25.07

Volume I (5.5, Bounding Accident Scenarios) addresses reasonably foreseeable human health effects under No Action, the Proposed Action, and a Reduced Operation Alternative from potential radiological, chemical, high explosive, and biological accidents. Since release of the DEIS/PDSEIS, the Defense Nuclear Facilities Safety Board (DNFSB), an independent Federal agency, issued findings and recommendations regarding LLNL's proposed safety basis for Building 332 (Plutonium Facility). An April 12, 2004 DNFSB letter to the National Nuclear Security Administration (NNSA) identified "significant deficiencies" in LLNL's proposed safety basis for the Plutonium Facility (copy of DNFSB's letter enclosed). The DNFSB's letter raised concern regarding the potential for an "unfiltered release of radioactive materials from the facility [i.e., Building 332] during certain accident scenarios." The DNFSB informed the NNSA that this "reduces the margin of safety and the defense-in-depth currently provided for protection of the public, collocated workers, and other on-site individuals."

Recommendation: The FEIS/PFSEIS should evaluate if potential modifications of LLNL's facility operations are warranted based on the DNFSB's recent findings and recommendations. If so, the NEPA Record(s) of Decision should incorporate appropriate mitigation and/or monitoring.

**Presenting Data on Inadvertent Events at LLNL and Site 300**

9/25.06

Appendix C-32 to C-36 is a chronology of worker accidents at LLNL from 1996 to 2001. We commend having this valuable information in the DEIS/PDSEIS. Table 7.4-1 provides a summary of "inadvertent events" at LLNL in 2002. Although we support including data on inadvertent events, it is unclear why only one year's data was given rather than five years, as provided for worker accidents.

Recommendation: The FEIS/PFSEIS should include inadvertent events data for the five most recent years at LLNL and Site 300.

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## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street  
San Francisco, CA 94105-3901

MAY 21 2004

Suzi Jackson, Leader  
Operations and Regulatory Affairs Division  
Lawrence Livermore National Lab (Mail Stop L-633)  
P.O. Box 808  
Livermore, CA 94551

Dear Ms. Jackson:

Enclosed is the U.S. Environmental Protection Agency's (EPA) Compliance Evaluation Inspection Report for the Lawrence Livermore National Laboratory (LLNL), based on the inspection performed by EPA from November 4 through 7, 2003. Although the inspection report notes several potential violations, it appears that LLNL has corrected or is in the process of correcting these matters of noncompliance. Whether any further enforcement action as a result of these potential violations will be sought is a question left for individual EPA media programs to decide as they deem appropriate. Any omissions in the inspection report shall not be construed as a determination of compliance with applicable regulations.

The enclosed report identifies potential violations of the Resource Conservation and Recovery Act (RCRA), California's authorized program under RCRA Subtitle C, and the Spill Prevention Control and Countermeasure (SPCC) requirements of the Oil Pollution Act. LLNL's return to compliance with respect to the potential RCRA violations was observed by EPA during the inspection. To remedy its noncompliance with respect to the potential SPCC violations, LLNL must update the SPCC Plan to reflect changes in facility operations and modify the inspection program for double walled aboveground storage tanks. For a more specific discussion of the changes necessary, see Section 5.1 of the report. LLNL is not required to submit documentation of its return to compliance with respect to the potential SPCC violations, but EPA expects that these revisions to the SPCC Plan will be made immediately, and EPA will verify that LLNL has made the necessary changes in a subsequent SPCC inspection.<sup>1</sup>

<sup>1</sup> Note that, on July 17, 2002, EPA issued a final rule amending the Oil Pollution Prevention regulations contained in 40 C.F.R. Part 112. The rule changes were intended primarily to clarify the language and organization of the regulations. Information regarding these new regulations, as well as the compliance date for them, may be found by visiting EPA's web page at "www.epa.gov/oilspill." As a result, LLNL must prepare an amended SPCC Plan conforming with these new regulations on or before August 17, 2004.

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EPA routinely provides copies of investigation reports to agencies not copied on this letter and, upon request, to the public. Such releases are handled according to the Freedom of Information Act's implementing regulations (40 CFR Part 2). If LLNL believes this report contains privileged or confidential information, it may make a claim within fourteen (14) calendar days from the date of this letter. EPA will construe LLNL's failure to furnish a timely claim as a waiver of the confidentiality claim.

EPA would like to take this opportunity to acknowledge the cooperation provided by LLNL staff during the multimedia inspection. If LLNL staff have any questions regarding this report, please have them contact Tom Kelly at 415-972-3856.

Sincerely,

Enrique Manzanilla, Director  
Cross Media Division

Enclosure: Compliance Evaluation Inspection Report for Lawrence Livermore National Laboratory, Livermore, California

cc: Phil Hill, Department of Energy  
Susan Hugo, Alameda County Health Agency  
Charles McLaughlin, State Regulatory Program Division, DTSC

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April 12, 2004

The Honorable Linton Brooks  
Administrator  
National Nuclear Security Administration  
U.S. Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-0701

Dear Ambassador Brooks:

In October 2003, Lawrence Livermore National Laboratory (LLNL) submitted a proposed safety basis for Building 332, the Plutonium Facility, to the National Nuclear Security Administration's (NNSA) Livermore Site Office (LSO). This proposed safety basis was developed in accordance with the requirements of the Nuclear Safety Management rule (10 CFR Part 830). The staff of the Defense Nuclear Facilities Safety Board (Board) has identified significant deficiencies in this document and some of its supporting references. Many of these deficiencies appear to have been noted by LSO as well, as demonstrated by the more than 270 comments communicated by LSO to LLNL. A copy of a report on these issues, prepared by the Board's staff, is enclosed for your information and use during the approval process for the proposed safety basis for Building 332.

Of particular concern to the Board is a new approach adopted by LLNL to allow the unfiltered release of radioactive materials from the facility during certain accident scenarios. This approach reduces the margin of safety and the defense-in-depth currently provided for protection of the public, collocated workers, and other on-site individuals. Moreover, the proposed approach does not consider the potential impact of an unfiltered release on the recovery strategy or postaccident monitoring for the facility. Additionally, there do not appear to be any safety or operational benefits to be gained from this approach.

The current safety basis for Building 332 relies on an active safety-class ventilation system, in concert with its support systems, to prevent the release of unfiltered radioactive materials during an event. Portions of this ventilation system, along with several other safety-class systems, have been downgraded from their high reliability and existing operational safety functions in the proposed safety basis.

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The Honorable Linton Brooks

Page 2

The Board believes that LLNL's new approach to allow unfiltered release of radioactive materials from potentially hazardous events is inconsistent with the defense-in-depth philosophy that is the hallmark of nuclear facility and operational safety. Therefore, pursuant to 42 U.S.C. § 2286b(d), the Board requests a report by NNSA within 30 days of receipt of this letter providing NNSA's position on LLNL's approach.

Sincerely,

John T. Conway  
Chairman

c: The Honorable Everett H. Beckner  
Mrs. Camille Yuan-Soo Hoo  
Mr. Ralph E. Erickson  
Mr. Mark B. Whitaker, Jr.

Enclosure

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Staff Issue Report

March 17, 2004

MEMORANDUM FOR: J. K. Fortenberry, Technical Director

COPIES: Board Members

FROM: F. Bamdad  
D. Kupferer

SUBJECT: Safety Basis Review at Lawrence Livermore National Laboratory

The staff of the Defense Nuclear Facilities Safety Board (Board) visited Lawrence Livermore National Laboratory (LLNL) on March 1–4, 2004, to continue its review of the safety basis for Building 332, the Plutonium Facility. The review included an update on activities conducted in response to previous findings communicated by the Board to the National Nuclear Security Administration (NNSA) in a letter dated April 10, 2003, as well as discussions on the proposed Documented Safety Analysis (DSA) submitted to NNSA's Livermore Site Office (LSO) in October 2003. Staff members W. Andrews, F. Bamdad, D. Kupferer, A. Matteucci, and M. Merritt participated in this review.

**Response to the Board's Letter.** In response to findings contained in the Board's letter dated April 10, 2003, related to implementation of the Conditions of Approval (COAs) of the safety bases, LSO has taken an aggressive role in ensuring that all COAs are identified and tracked to satisfactory closure. Unfortunately, because of limited resources, only a fraction of the COAs had been verified as closed by the time of this review. LSO has committed to verifying closure of all of the COAs before approving the proposed DSA.

In response to the Board's letter dated April 10, 2003, LLNL performed a survey of some of its non-nuclear facilities to identify needs and methodologies for improving the chemical materials inventory tracking system known as CHEMTRAC. As a result, LLNL is taking steps to enhance CHEMTRAC to make it a transaction-based system, as well as changing the software so that the system will be health/consequences-based. That is, real-time inventory tracking will be implemented at each facility to ensure that threshold limits based on hazardous consequences will not be exceeded.

**Building 332 Safety Basis.** LLNL submitted a DSA to LSO for review and approval in accordance with the requirements of the Nuclear Safety Management rule (10 CFR Part 830). The Board's staff reviewed this document and some of its supporting references, and met with LLNL and LSO representatives to discuss its observations. The following is a summary of some of the issues discussed during these meetings. Many of these issues appear to have been noted by LSO, as demonstrated by the more than 270 comments communicated by LSO to LLNL.

**Overview**—Major components of four safety-class systems in the current Building 332 Safety Analysis Report have been downgraded to safety-significant in the proposed DSA. The four downgraded systems are (1) the emergency power system, (2) portions of the glovebox

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ventilation system, (3) portions of the room ventilation system, and (4) portions of the fire detection and suppression system. Some components of these systems (e.g., the uninterruptable power supply) have been further downgraded to non-safety-level. This action could degrade the defense-in-depth posture of the Plutonium Facility.

**Identification and Analysis of Hazards**—LLNL used a methodology from safe harbors identified in 10 CFR Part 830 to prepare the DSA, but used an in-house procedure to identify and analyze the hazards associated with the activities performed in Building 332. LLNL conducted a systematic walkdown of the facility; identified approximately 60 hazard types; and proposed potential controls to protect the public, workers, and the environment. Some of the controls were classified as safety-significant since they were designated to protect workers from fatality, serious injury, or hospitalization. The hazard analysis summary tables in the proposed DSA list both engineered and administrative controls. The tables also distinguish between controls that are credited as safety controls and those that are not.

In reviewing the DSA, the Board's staff learned that LSO had directed LLNL to continue preparing the DSA without implementing Change Notice 2 of the Department of Energy (DOE) DOE Standard 3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*—although the notice was issued in April 2002, nearly 18 months prior to completion of the proposed DSA. Change Notice 2 specifies that safety-significant controls must be identified to protect workers from significant radiological or chemical hazards, in addition to those controls selected to prevent worker fatalities and injuries. LSO's decision may have resulted in less than adequate protection of workers from hazardous activities. LSO representatives are requesting that LLNL develop a schedule to incorporate Change Notice 2 into all DSAs.

**Accident Analysis**—LLNL is pursuing a new approach to accident analysis in that potentially harmful consequences to the public are mitigated by the structural boundaries of Building 332, which is assumed to reduce the unmitigated release of radioactive materials. In the past, Building 332 relied on a safety-class active ventilation system to ensure that the radioactive materials released during an accident, such as a fire, would be forced through a series of high-efficiency particulate air (HEPA) filters before being released to the outside environment. Under LLNL's new approach, it is assumed that the building's leak paths would physically reduce the release of unfiltered contaminated air from the facility.

Validation of LLNL's new approach requires analytical modeling of the building's leak paths to the outside, and estimation of the percentage of any radioactive materials that would be released unfiltered (leak path factor (LPF)) after an accident. An LPF of 5 percent, as assumed in the proposed DSA, would result in public dose consequences that LLNL believes should be acceptable. In the DSA, for example, the unmitigated consequence (LPF of 100 percent) of a fire resulting from a hydrogen deflagration is estimated to be about 18 rem at the site boundary. As calculated in the DSA, this same deflagration scenario would result in an unfiltered, mitigated dose consequence of about 1 rem to the public, based on an LPF of 5 percent. As a result, the



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DSA downgrades portions of the active ventilation system and its supporting equipment, such as the emergency power supply, from its current safety-class to safety-significant status.

The Board's staff reviewed the LPF analysis and discussed it in detail with its authors and LLNL representatives. Several assumptions in the analysis are unrealistic and inconsistent with other authorization basis documents and facility procedures:

- d: In the LPF analysis, the facility is modeled by several nodes or compartments, connected via junctions or flow paths for the door cracks and other potential openings of the building. This model fails to account for the additional leak paths that would result from the use of emergency exit doors by Building 332 personnel as they evacuate the facility during a fire. Evacuation is essential for worker protection, as described in the facility-specific Fire Hazard Analysis. Therefore, the calculated LPF of 5 percent is unrealistic and probably underestimates the extent of a release of unfiltered radioactive material from the facility.
- e: The LPF calculations are based on a fire scenario that lasts for only 30 minutes, with the entire event assumed to end after 2 hours. In reality, such an event could continue for days until any airborne radioactive material released by the fire into the internal facility atmosphere had either been removed by settlement, released to the outside environment, or removed through other remedial actions. The reason for this is that airborne radioactive material released during a fire would remain trapped within the confines of the facility because of the lack of filtration by an active ventilation system. Eventually, material would leak to the outside environment through diurnal effects, wind impact on the building, or other natural phenomena. These phenomena are either not modeled or incorrectly analyzed, and their important effect on the long-term breathing of the facility is not properly accounted for in the calculation of the LPF.
- f: The computer program manual used to calculate the LPF—CONTAIN—has cautionary notes with regard to its use for modeling. These notes recommend performing sensitivity analyses on important input parameters (e.g., the size of a time step) to prevent incorrect conclusions. Such sensitivity analyses have not been performed in support of the LPF calculations for the proposed DSA, and it is not clear whether conservative input parameters are used in the analyses.

Furthermore, it does not appear that LLNL has considered the potential impact of the new passive mitigation approach on any accident recovery strategy or postaccident monitoring for the facility. Without being able to depend on the use of an active ventilation system to guide the flow of air through the HEPA filters after an event, it is conceivable that the spread of contamination throughout the facility could jeopardize the facility's recovery and future use. An unfiltered release through the unmonitored pathways would also prevent the postaccident monitoring of radioactive materials released to the environment.

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*Identification and Implementation of Controls*—Identification of appropriate boundaries for safety controls and their support systems is a shortcoming in both the existing safety basis and the proposed DSA for Building 332. For example, the fire detection and alarm system is identified as safety-significant to protect workers from the potential consequences of a fire in the facility. The heat and smoke detectors, the MXL® control panel and its associated power supply, and the flow switches are defined as being within the boundaries of the fire detection and alarm system. However, the annunciation system has not been defined as being within the boundaries of the fire detection and alarm system, and therefore has no safety designation. It is not clear how workers can be notified so they can take appropriate action if the annunciation system has failed. Furthermore, in December 2002, the emergency voice alarm system, which is part of the annunciation system, was identified as not meeting the requirements of National Fire Protection Association (NFPA) 72, *National Fire Alarm Code*, in the facility's Fire Hazard Analysis. No action appears to have been taken to remedy this situation. Similarly, the fire suppression system is identified as safety-class, but none of the supporting water supply systems have a safety-related designation—the tertiary fire water tanks in the basement are classified as defense-in-depth. It would be prudent to classify the tertiary fire water tanks as safety-significant and part of the fire suppression system boundaries.

The descriptions of some of the controls in the proposed DSA are very vague; in particular, some engineered features that are relied upon for worker safety are poorly defined and may be difficult to implement. For example, the DSA defines many controls as Equipment Design without specifying the type of equipment or how it would protect workers. This lack of detail in the DSA could lead to several safety-related shortcomings:

- Workers could be inadequately protected because of a lack of knowledge of the specific control that needs to be implemented.
- Poorly defined controls could be removed from a procedure inadvertently resulting in a less-than-desirable safety posture.
- Future unreviewed safety question (USQ) determinations could be inconclusive or incorrect because the controls that may be subject to the USQ process are not clearly defined.
- Sections 830.122(e)(1) and 830.201 of the Nuclear Safety Management rule require that the controls identified in the DSA be implemented by the contractor when the associated activities are performed. Lack of detail in defining the controls could result in insufficient information for LLNL to demonstrate compliance with the rule.

In other instances, credit has been taken for safety-significant equipment preventing hazards without proper functional classification. For example, the glovebox water-cooling system is credited with protecting the surface of the glovebox and reducing the heat load from a molten plutonium spill. However, the glovebox water-cooling system is not identified as safety-

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significant.

The Board's staff also identified some administrative controls that are inconsistent with the supporting calculations in the proposed DSA. For example, the potential for a solvent explosion event is substantially reduced by limiting the amount of flammable materials in a glovebox. The administrative limits in the Technical Safety Requirements (TSR) document, however, are not consistent with the conclusions in the DSA reference calculations. Additionally, the safety-related administrative controls are not identified as such in the proposed DSA. Such administrative controls are subject to DOE's Implementation Plan for the Board's Recommendation 2002-3, *Requirements for Design, Implementation, and Maintenance of Administrative Controls*, for potential future enhancements.

Some safety management programs, identified in both the existing and proposed TSRs, do not appear to have been properly implemented. For example, TSR Administrative Control 5.11 requires that a program be established, implemented, and maintained to ensure that the conditions identified in Table 5-7 of the proposed DSA<sup>1</sup> are maintained in the facility. Administrative Control 5.11 defines five key attributes to be included in the program. The attributes identified in the TSRs would enhance programmatic implementation of the administrative controls, as is the focus of Recommendation 2002-3. This program is also identified in the current approved TSRs; however it does not appear to have been implemented.

<sup>1</sup> This Table 5-7 does not appear to exist in the proposed DSA.

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AND PUBLIC WORKS  
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May 24, 2004

The Honorable Spencer Abraham  
U.S. Department of Energy  
1000 Independence Ave., SW  
Washington, DC 20585

Dear Secretary Abraham:

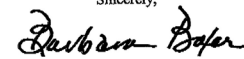
I am writing on behalf of my constituents in California to request a 30-day extension for the public comment period for the Site-Wide Environmental Impact Statement (SWEIS) for the Lawrence Livermore National Laboratory (LLNL).

1/31.02

It is my understanding that the SWEIS is a lengthy document over 2,000 pages long. Because of the amount of technical detail in the SWEIS, I believe that a 30-day extension for review is necessary for the public to thoroughly comprehend the impacts of the SWEIS' recommendations, and to send in written comments to the Department of Energy.

I encourage the Department of Energy to extend the public comment period for the review of the SWEIS for the Lawrence Livermore National Laboratory from May 27, 2004 to June 26, 2004. Should you have any questions, please contact Jennifer Tang at (415) 403-0116. Thank you for your consideration.

Sincerely,



Barbara Boxer  
United States Senator

BB:jbt

cc: Administrator Linton Brooks, Department of Energy, National Nuclear Security Administration  
Tom Grim, Department of Energy, National Nuclear Security Administration

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